understand that such patients gain little benefit, indeed, rather much harm, from a jejune and *doctrinaire* dietary which some authorities imagine to be necessary for all gouty patients. This is an example of treating the disease rather than the patient, a not uncommon practice even in these days.

TREATMENT.

With respect to the treatment of those persons who are goutily disposed by inheritance in any degree, it may be said to consist mainly in an appropriate nutrition with some restriction of animal food and a limited amount of saccharine matters, especially of food cooked with sugar and fatty material. Meals consisting of animal food and carbohydrates, with sugar, taken at one time, are found to be imperfectly digested by such persons. An open-air life, especially in inland and somewhat elevated districts, is desirable. Water much impregnated with lime is improper. Marine districts, especially in exposed situations, are apt to be unfavourable for most of these subjects.

Occasional aperients, containing some mercurial, are of especial value. In cases of an asthenic type, especially in young girls with feeble circulation and tendency to chilblains, it may be desirable to employ a small quantity of some red wine—Bordeaux or Burgundy—well diluted with water, with the principal meal in the day. Exposure to cold and damp is especially to be avoided.

ON THE SUPRAPUBIC TRANSVERSE FASCIAL INCISION IN GYNÆCOLOGY.¹

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FOR many years the median longitudinal incision between the pubes and the umbilicus has held pride of place in operations on the uterus and its appendages. It fulfils the first essentials of giving direct access to the seat of operation, and providing sufficient room for the necessary manipulations on either side of the pelvis or lower abdomen, and it has the advantage of being readily enlarged when required. The division of the linea alba was recommended as the most convenient, because here no vessels or nerves of importance are encountered, while drainage by tube or gauze can easily be arranged. With increasing experience the main disadvantage of this incision, its liability to be followed by hernia, came into ever greater prominence. Hernia was especially apt to follow in cases where drainage was provided, or where healing was attended by suppuration, but it not rarely followed healing by first intention. Thus Abel observed hernia in 81 per cent. of cases where deep suppuration occurred in the incision, in 45 per cent. of superficial suppurations, and in 6 per cent. of cases where primary union was obtained.

To bring about a diminution in the frequency of ventral hernia efforts were made in various directions. Suturing in stages, and especially the careful suturing of the two most important layers, the peritoneum and the fascia, effected a marked improvement. Thus Winter reported that the separate suture of the fascia had reduced the percentage of ventral herniæ from 23 to less than 12 per cent. By some operators the peritoneal incision was made to one side of the middle line, so that it might be supported by the strong longitudinal rectus muscle. The sheath of one rectus was opened $\frac{3}{4}$ inch or so from the middle line, and then by blunt or sharp dissection the muscle itself was divided in the direction of its fibres. This was objectionable, because the nerve-supply of the mesial portion of the muscle was divided, with the result that this portion of muscle atrophied and became a weak part of the abdominal wall. The method was improved by Lennander, who divided the front of the sheath in the same way, and then displaced the rectus externally in order to open the posterior layer of the sheath from $\frac{1}{2}$ to $\frac{3}{4}$ inch from the middle line. The disadvantages of this incision are that access is not easy, especially to the structures on the other side of the abdomen; that the room provided by an equal length of incision is decidedly less than

in the case of the median incision; and that the wound cannot be so conveniently lengthened if required.

The first transverse incision was made for the purpose of affording sufficient access in specially difficult operations on the pelvic contents. Thus Mackenrodt in extensive operations for uterine cancer adopted the transverse curved incision previously devised by Bardenheuer. This semilunar incision extended across the whole lower abdomen from one anterior superior iliac spine to the other, curving downwards to a little above the pubes, and it divided all the structures of the abdominal wall, including the fascia, the rectus muscles, and the peritoneum. Healing was tedious and apt to be attended by suppuration, and there was a great liability to hernia. The incision has therefore never come into favour. The next suggestion for a transverse incision in gynæcological operations was intended chiefly to avoid the formation of a broad and unsightly scar, such as not infrequently results, especially in nulliparæ, from a longitudinal incision. In the middle line, and especially on either side of it, a longitudinal incision divides the bundles of fibres of the true skin across their long axes, and there is consequently a marked tendency for the lips of the wound to retract. It was therefore recommended by Küstner and Rapin that a transverse incision through the skin and superficial structures should be made a little above the pubes, the division there following the general direction of the fibres of the cutis, so that there would be no tendency for the edges of the incision to be drawn apart, even if primary union failed. The fascia and other deep structures were divided as usual in the middle line, so that this method of incision had no influence in preventing the formation of a hernia. It was, however, based on the correct and important principle of dividing fibrous structures whenever possible in the direction of the fibres instead of across them.

It was Pfannenstiel's happy inspiration to carry the transverse incision a step deeper by dividing the fascial sheath of the recti as well as the superficial structures, and in this way to afford a strong additional safeguard against subsequent hernia. The sheaths of the recti are formed by the union of the tendinous expansions of the three great flat muscles of the abdominal wall. Below the semilunar folds of Douglas all three aponeuroses pass in front of the rectus to decussate in the linea alba with the corresponding structures from the other side. The general direction of the fibres forming these strong sheets is in the line of pull of the muscles which they serve as tendons, and is, roughly speaking, transverse. A longitudinal incision through the sheath of the rectus or the linea alba therefore cuts across the fibres, and union is relatively weak and yielding, whereas a transverse incision runs nearly parallel to the direction of the fibres, and union takes place readily and firmly. The effect of contraction of the abdominal muscles in tending to bring the edges of an incision in the fascia together can occasionally be seen during an attack of retching and straining arising during the insertion of the sutures. It would be correct to describe Pfannenstiel's incision as the longitudinal section of the fascia, contrasting it with the usual division in the middle line, where the fibres of the fascia are cut transversely.

The method of making the incision is as follows. A transverse incision from $3\frac{1}{2}$ to 4 in. in length, slightly curved with the concavity upwards, is made about two fingers' breadth above the pubes and carried down through the subcutaneous fatty tissue and the deeper layer of the superficial fascia to the sheaths of the recti, which are then also divided transversely by knife or scissors to the full extent of the incision. The sheath of each rectus can then be easily raised by passing a finger between it and the muscle, the flap of fascia being readily drawn up except from the middle line where the pyramidal muscles are inserted into the fascia, and require a light touch of scalpel or scissors. The flap of fascia having been well pulled up in the middle line, the recti are pulled apart by retractors and the transversalis fascia and peritoneum are divided longitudinally in the usual manner. If more room is required at the lower part of the incision the lower ends of the sheath of the recti can be separated from the muscles in a similar manner, and the peritoneal incision then continued downwards. It is usually advantageous to fix the end of the upper flap by suturing the fascia to the skin below the umbilicus; the suture acts as a retractor and facilitates subsequent manœuvres. If required, more room can be obtained by extending laterally the incision through the skin and fascia and pulling up the fascial flap to a higher level. In this extension the incision is prolonged to

¹ A paper read at the Birmingham Branch of the British Medical Association, Feb. 16th, 1911.

a point where the fascia separates into its constituent layers, but this makes no difference to the subsequent suturing.

At the close of the operation the peritoneum with the transversalis fascia is first brought together by continuous or interrupted catgut sutures. Two or three catgut sutures then bring the muscles together in the middle line, and are tied gently so that the muscular fibres may not be cut across; one of these sutures should be placed at the level of the transverse incision through the fascia, the only position at which hernia may possibly develop later. The fascia is then brought together by interrupted catgut sutures; or the skin and fascial layers may be brought together by deep silkworm-gut sutures. My own practice is to introduce two silkworm-gut sutures, one on each side of the middle line, and then to suture the rest of the fascia with interrupted catgut. Finally, the edges of the skin are brought together with silkworm gut. In closing the incision it is desirable to make sure, by sponging and pressure, that no collection of blood and no empty space are left between the different layers, especially between the fascia and the surface of the muscles.

To secure perfect coaptation it has been recommended to place over the wound a sand-bag weighing from 2 lb. to 9 lb. for the first 24 or 48 hours. This was tried in a series of my cases, but has since been discarded. The subsequent use of an abdominal belt is unnecessary, and this is fortunate, because owing to the position of the cicatrix it appears to be impossible to devise a belt that will afford effective support.

I have employed this incision in upwards of 120 operations on the uterus and its appendages, and am using it more frequently with increasing experience of its advantages. It affords direct access to the whole brim, and especially to the sides of the pelvis, where manipulations are more easily carried out than through the classical median incision. This facility depends upon the fact that the fascia having been raised from the rectus muscles these are much more easily drawn out of the way by retractors or the fingers of an assistant; as pointed out by Döderlein, the muscles are now like soft rubber bands. In several cases where it has been necessary to remove the vermiform appendix in the course of a gynæcological operation, I have found the incision give full and easy access for the purpose.

The operations which I have performed with the aid of the transverse incision include 42 hysterectomies and myomectomies for uterine fibroids. In these the largest tumour was of the size of a man's head, and many extended as high as the umbilicus. In 17 cases of cysts and tumours of the ovary, the largest reached the size of a football. The list further includes 22 operations for inflammation of the uterine appendages and pelvic peritoneum, of which 12 were suppurative; 23 abdominal fixations for uterine prolapse and retroversion, 5 cases of tubal gestation, the radical cure of a vesico-vaginal fistula where two operations through the vagina had failed, and 3 abdominal operations for uterine cancer after Wertheim's method.

It was at first objected that gangrene of the flap of the fascia might be expected, but experience has shown that this does not occur. The vascular supply to the fascia is not understood, and anatomists have nothing to tell us on the point. The vessels presumably course partly along the fibres from the vessels supplying the flat muscles and partly penetrate the fascia from the overlying connective tissue. Wide separation from the recti can be made without any apparent injury to the nutrition of the fascia. The incision heals well. In 13 of my cases there has been some suppuration of the wound; with two exceptions this occurred in cases of uterine cancer or suppurative inflammation of the appendages, where it was impossible to avoid infecting the wound during the operation. In another case a hæmatoma under the fascial flap caused swelling and tenderness for more than three months. In about a fifth of the remaining cases there were collections of serum in the wound, whether due to imperfect coaptation or to the use of iodine catgut is uncertain. When the serum was let out the surfaces fell together, and union promptly followed without suppuration. In the remaining cases healing by first intention was perfect.

Since my first case dates back only some two and a half years I am unable to speak from personal experience as to the occurrence of ventral hernia; I have seen none so far. The percentage occurrence appears to be less than half that following the use of the vertical incision. Pfannenstiel himself in 198 cases found one hernia only. Kroenig in 127

cases found 4 herniæ—3·1 per cent.—two of them occurring after the wound had healed by first intention.

I believe the incision is the best that has yet been devised for the ordinary run of gynæcological operations, including fixations and operations for inflammatory conditions, extra-uterine gestation, and for uterine and ovarian tumours not extending higher than the umbilicus. In larger tumours, especially where there are extensive adhesions or where the upper connexions are uncertain, it is better to employ a median vertical incision, which can readily be extended as high as required. In the largest transverse fascial incision that I have made the division of the peritoneum and transversalis fascia extended upwards to $1\frac{1}{2}$ inches above the umbilicus, but I think it is better as a rule to reserve it for tumours which do not extend higher than the level of the umbilicus. For exploratory incisions in diffuse abdominal conditions, or where it is desirable to investigate the contents of the upper part of the abdomen, the longitudinal incision is to be preferred. Where rapidity in operating is a primary necessity the median incision is better, since it takes rather less time to make and to suture.

In septic cases, as, for instance, in pyosalpinx and in uterine cancer, the vertical incision has hitherto been generally preferred because of the fear of suppuration in the transverse wound, and because of the difficulty of providing drainage through the transverse incision. In gynæcological operations drainage is now generally provided when necessary through the vagina, and it is rarely necessary, or even desirable, to drain through the abdominal incision. The fear of the consequences of suppuration in the transverse incision is, in my opinion, not well founded. It is quite easy if desired to drain the spaces between the fascia and the rectus muscles by small rubber tubes or strips of gauze, brought out at each lateral angle of the incision; and even if suppuration does take place the fact that the fascia and skin are divided parallel with the general direction of their fibres makes gaping less and allows the surfaces to fall together, so that a scar results which is less likely to lead to hernia than one following suppuration of a median longitudinal incision. Klotz in Sellheim's cases found among 84 in whom the healing of the incision was accompanied by suppuration six patients who showed small defects in the fascia without hernia and three in whom hernia had developed. All these nine cases had been well drained or had shown extensive suppuration. I have myself adopted the incision in three cases of Wertheim's hysterectomy, and in several operations for suppurative conditions of the Fallopian tubes and ovaries, and have found it at least as suitable as the median.

In the Trendelenburg position the transverse incision forms a flap which covers the intestines during the operation, protecting them from handling and from loss of heat and moisture. In many cases, indeed, the intestines hardly come into view during the whole proceeding. The importance of this in minimising shock is obvious; in laparotomy, with the help of the transverse incision, there is in suitable cases no more shock than in similar operations performed by the vaginal route, and in every other respect the abdominal method has the advantage that it gives a better oversight of the parts to be operated upon, and of any adhesions that may require to be dealt with, and that it gives better and more convenient access, so that diagnosis is fuller and operation easier.

To sum up the advantages which I conceive that the transverse fascial incision offers over the longitudinal incision, in suitable cases, the first and by far the most important is the lessened risk of ventral hernia. In the next place I consider that in the ordinary run of gynæcological operations this incision affords easier access and more ample room than the longitudinal incision, and especially than the paramedian incision of Lennander. Finally, it is possible that the cosmetic effect may be deemed by some to be of importance; the scar is linear and is concealed by the pubes and by the natural folds of the abdominal wall.

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